



# College Pays Dividends— More So in Texas than U.S.

By Anil Kumar

*Demand shifts driven  
by trade and technology  
help explain the rise  
in the college  
premium.*

**E**conomic research confirms what parents have been telling their children for generations: College education pays off in higher earnings. Indeed, the gains from earning a college degree have been rising over the past quarter century—in both the nation and Texas.

In 1980, a typical U.S. worker with a college degree earned about 50 percent more than a high school graduate. By 1990, the differential rose to 73 percent; by 2000, a college graduate earned 85 percent more. Now, it's up to 97 percent.

The college premium grew even faster in Texas. In 1980, the state was on par with the nation, after adjusting for age, experience and other demographic factors (*Chart 1*).<sup>1</sup> By 1990, the differential was 79 percent, or 6 percentage points better than the nation. Texas maintained its lead into 2000 and widened it to more than 10 percentage points in recent years.<sup>2</sup>

Supply and demand go a long way toward explaining rapid increases in the college premium since the 1980s. U.S. col-

leges have been sending more graduates into the workforce; even so, paychecks have gone up because demand for higher-skilled workers has risen even faster, the result of technological change, trade and other factors.

Texas' faster increases suggest demand growth has outpaced supply growth by a wider margin in the state than the nation. One possible reason is that the state's skill-intensive sectors have grown more rapidly, stimulating demand for college-educated workers and raising their wages. Other interpretations aren't as benign. For example, stingy educational funding may have led to shortages of skilled workers in Texas, driving up relative demand for those who remain. These explanations have starkly different public-policy implications, so it's critical to understand why the state's college premium tops the nation.

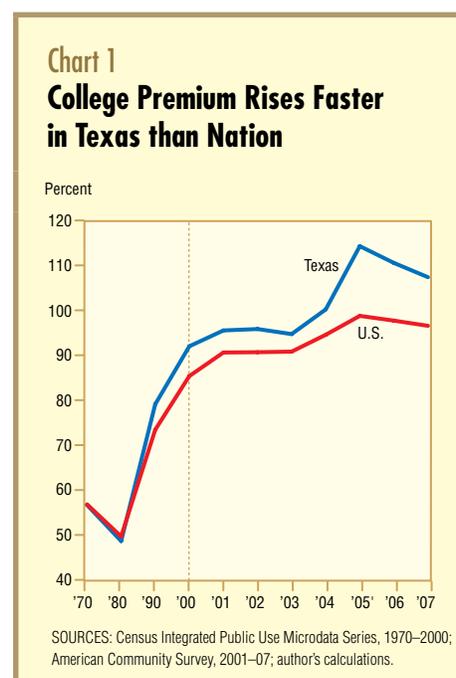
## Demographic Breadth

The rising college premium doesn't merely reflect developments in isolated segments of the workforce. The gains from college grew more rapidly in Texas than the nation across key demographic classifications—age, gender and ethnicity.

Texans in their 40s, for example, broke ahead of the national norm in just the past five years (*Chart 2A*). Higher pay among those under age 30 starts earlier. The state exceeds the nation in the share of younger workers in the labor force, suggesting age is a key to the college premium's faster growth in Texas.<sup>3</sup>

U.S. nonwhites have consistently enjoyed a higher college premium than whites over the past quarter century (*Chart 2B*). In Texas, the two groups' gains from additional education have been largely similar.

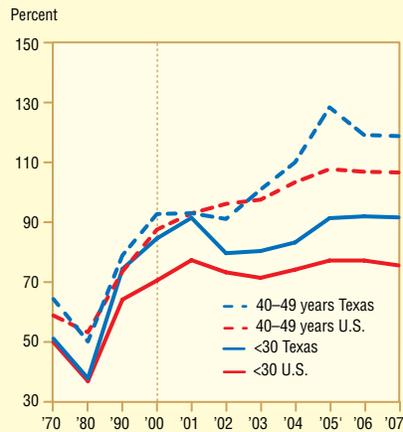
College premiums for whites have been higher in Texas than the U.S. since the 1980s. After growing at roughly the same pace in the 1980s and slowing somewhat in the '90s, nonwhite Texans started to make gains on their national peers early in this de-



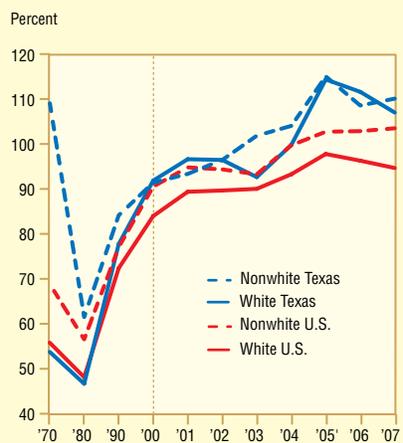
*Demographics tell only part of the story. Other factors are also at work across the nation—for example, the erosion of the real minimum wage and the decline in unionization. These could lower the wages of the unskilled.*

## Chart 2 College Premium Rises Broadly

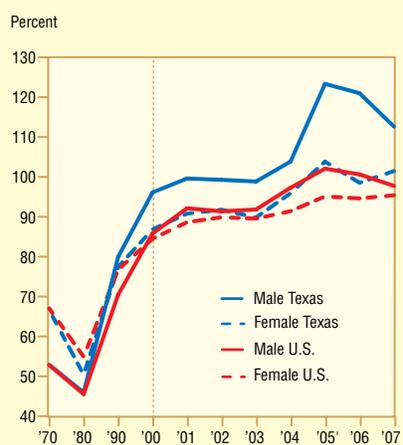
### A. Texas Edge Holds Across Age Groups ...



### B. ... and Across Racial Lines ...



### C. ... but Gender Shows Different Pattern



SOURCES: Census Integrated Public Use Microdata Series, 1970–2000; American Community Survey, 2001–07; author's calculations.

cade. Because Texas has a larger nonwhite population than the U.S., racial makeup may help explain why Texas' college wage differential exceeds that of the nation.

Gender isn't as straightforward. The gap between Texas and U.S. women was quite small. Texas men, on the other hand, had a significant edge over the nation in the college premium (*Chart 2C*). Between 1980 and 2000, employment of male college graduates rose faster in Texas than the nation, driven primarily by job growth for skilled workers in such sectors as professional and business services, education and social services, transportation and communication, and high-tech manufacturing.<sup>4</sup>

Other demographic factors may also impact the higher college premium in Texas. The immigration of unskilled workers from Mexico has been higher in Texas than the nation, which could have put downward pressure on the wages of unskilled workers. This pressure could have contributed to a rise in the relative wages of college graduates.

## Supply and Demand

Demographics tell only part of the story. Other factors are also at work across the nation—for example, the erosion of the real minimum wage and the decline in unionization. These could lower the wages of the unskilled. Most researchers find, however, that strong demand growth relative to supply growth has been the most important factor in the college premium's increase for both the U.S. and Texas.<sup>5</sup>

We use efficiency units to measure labor supply at each education level, multiplying total annual hours by a relative wage measure.<sup>6</sup> Hours logged by workers with a college degree shows a similar pattern in Texas and the nation—a sharp slowing of growth in the 1980s to the 1990s and a flattening in this decade.

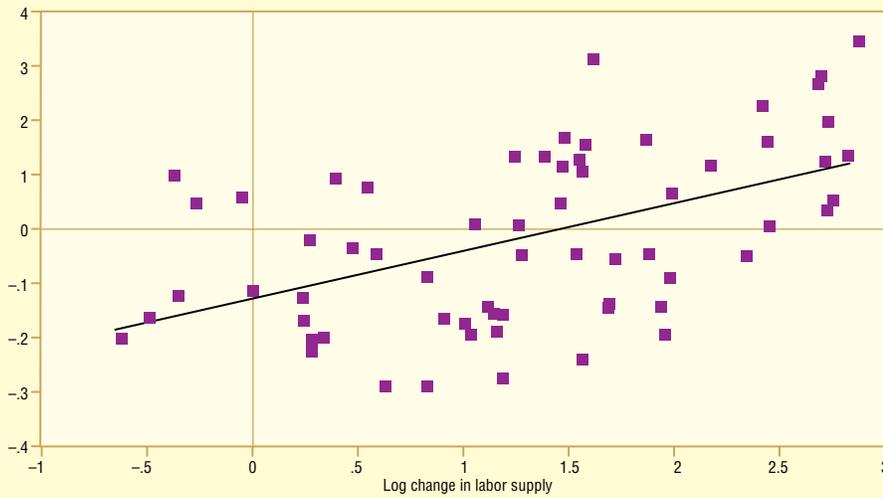
In Texas, wage growth has been higher in demographic groups for which labor supply has increased (*Chart 3*). If supply were the predominant factor in determining wages, increasing hours worked would cause wages to fall. The rising wages suggest that demand in these sectors rose at a relatively rapid pace. The results are similar to what other researchers have found for the nation.<sup>7</sup>

We look next at the demand side. Nationally, researchers have found that shifting relative demand for high- and low-skilled workers can explain the rising college premium. These

Chart 3

### Texas College Graduates' Wages Rise Even as Labor Supply Increases

Log change in relative wages



NOTE: Squares represent demographic groups defined by gender, education and labor market experience.  
SOURCE: Census Integrated Public Use Microdata Series, 1970–2000.

shifts occur across industries when sectors with high concentrations of college graduates—for example, professional and business services—grow faster than those more likely to employ high school graduates, such as manufacturing.

International trade affects the relative demand for workers across industries. From 1980 to 2000, for example, Chinese products as a share of U.S. imports jumped from less than 1 percent to 8.5 percent. Imports of Mexican goods more than doubled from 5 percent to 11 percent over the same period.

Rising imports from countries with cheap and abundant low-skilled workers reduced demand for U.S. workers in light manufacturing, depressing wages for high school graduates. At the same time, increasing U.S. exports of high-tech equipment and white-collar services added to demand for highly skilled workers, putting upward pressure on their pay.

Even within sectors that employ many high school graduates, technological change has tipped the balance in favor of college graduates. Computerization, for example, reshaped the landscape in favor of skilled workers within most industries, manufacturing and services alike. Such change shifts demand toward the better educated in a way that's independent of trade.

These two forces—trade across industries, technology within them—have been stronger in Texas than the U.S. From 1980 to 2000, the state's employment shares in-

creased faster than the nation's in industries that had larger shares of college graduates—that is, those with more skill-intensive workforces (Chart 4).

Among major sectors based on annual hours worked, professional and business services and education had the highest percentages of college graduates between 1980 and 2000. They also had the largest employ-

ment-share gains in Texas as well as the U.S.

Retail trade and transportation—two relatively less skill-intensive sectors—had the largest shares of high school graduates from 1980 to 2000. Retail trade ranked fourth among major sectors in employment share growth, well behind professional and business services and education. Transportation managed only marginal gains, suggesting relatively weak labor demand.

For high school graduates, overall demand shifts were negative and roughly comparable for Texas and the U.S. from 1980 to 2000 (Chart 5A).<sup>8</sup> Within-sector changes were far more important than across-sector factors for both, suggesting technology was a reason for slower demand growth among low-skilled workers.

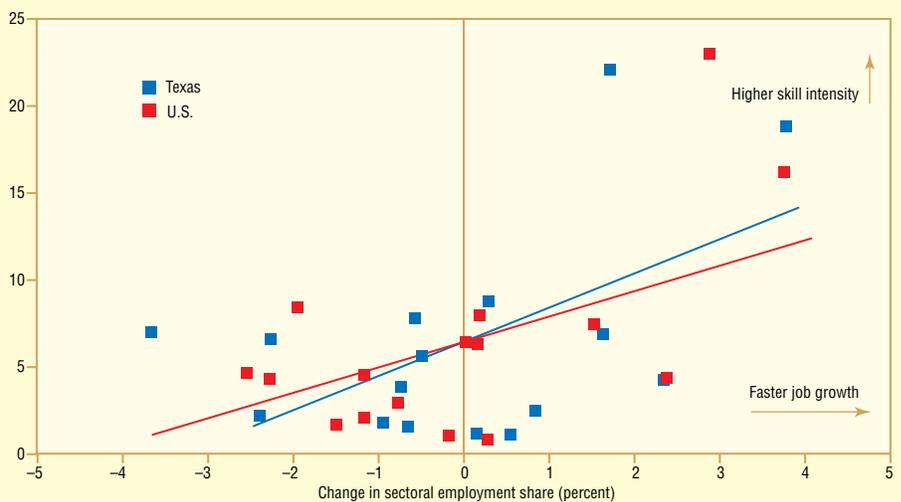
Female high school graduates saw demand increases from across-sector factors, reflecting demand changes across industries. Most likely, women held relatively fewer jobs in manufacturing and more jobs in services, a sector somewhat insulated from trade's negative impact on the wages of unskilled workers. The gains were largely offset by losses due to within-sector forces.

Across- and within-sector changes both sapped demand for male high school graduates, indicating the toll of trade and technology on factory jobs. High school-educated men fared somewhat worse in Texas than in the rest of nation.

Chart 4

### Employment in Skill-Intensive Sectors Grows Faster in Texas than Nation

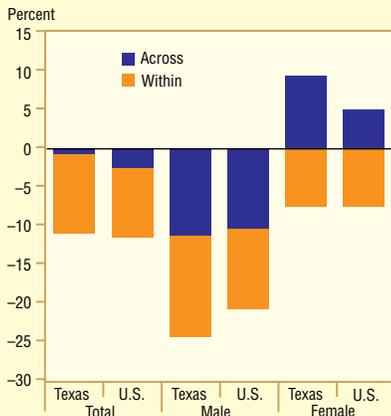
Sector's share of all college graduates (percent)



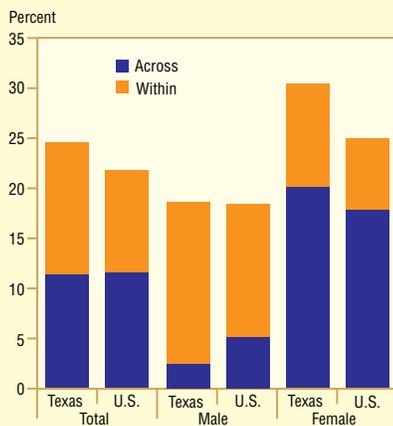
SOURCE: Census Integrated Public Use Microdata Series, 1980–2000.

## Chart 5 Demand Growth Differs by Educational Level

### A. Within-Sector Factors Explain Decline in Need for High School Graduates



### B. Across-Sector Changes More Important for Female College Graduates



NOTE: Demand index is multiplied by 100.

SOURCE: Census Integrated Public Use Microdata Series, 1980–2000.

Across- and within-sector factors are both important to the increasing demand for college graduates in Texas and the U.S. (Chart 5B). Texas' overall gains were slightly larger, mainly because of a stronger rise in demand for female college graduates.

Men's gains owe largely to within-sector factors that may reflect the spread of computers, the Internet and other technologies in the workplace, while women received greater benefits from across-sector factors tied to broad trends in the economy.

The supply-and-demand framework shows not only why college premiums have risen over time but also why they've increased faster in Texas. Demand shifts driven by trade and technology operated in Texas and the U.S., and they've been more important than supply shifts in explaining the trends in college premiums since the 1980s.

### Cause for Concern?

Long-term trends in the college premium have important implications, particularly when wage inequality increases dramatically. In 1980, a full-time worker at the 90th percentile of the wage distribution earned 3.8 times the wage of a worker at the 10th percentile.<sup>9</sup> In 2005, the 90th-percentile worker earned about five times as much, suggesting a 30 percent increase in the wage gap.

Many analysts consider the college premium a key component of widening wage inequality, fueling concerns that the less educated are being left behind. Apart from contributing to inequality, the college premium may also mean a more expensive skilled labor force. Texas ranks high among states for its business climate. An above-average college premium may discourage skill-intensive industries from coming to the state.

Policies that increase the supply of college-educated workers could help slow the rise in the college premium. Looking at data across states since the mid-1980s, one study found that slower growth in higher-education appropriations and faster growth in tuition costs led to smaller gains in college enrollments. With curtailed supplies of new graduates, college premiums increased faster.<sup>10</sup>

These results suggest that increasing college enrollment and attainment through more generous higher-education appropriations, slower growth in tuition and a greater number of colleges could help reduce the college premium in Texas by correcting the imbalance between college graduates' relative supply and demand.

The higher college premium, however,

may not be cause for alarm—at least not if it's due to increasing returns to human capital investment or accumulated skills that enhance the productivity of college graduates. In the long run, higher returns to education in Texas should encourage more high school graduates to get college degrees, a trend that may help mitigate the wage premium.

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### Notes

The author thanks Jason Saving and Carolina Rodriguez-Zamora for insightful comments.

<sup>1</sup> Data are from the Census Bureau's American Community Survey for 2001 to 2007 and the Integrated Public Use Microdata Series: Version 4.0 (machine-readable database), by Steven Ruggles, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King and Chad Ronnander, Minneapolis, Minn.: Minnesota Population Center (producer and distributor), 2008, <http://usa.ipums.org/usa>.

<sup>2</sup> The differences in the college premium between Texas and the nation are statistically significant. The 95 percent confidence bands for the two don't overlap any time after the mid-1980s.

<sup>3</sup> For the nation, college premium growth since the 1980s has been found to be faster among younger workers than older workers. See "Can Falling Supply Explain the Rising Return to College for Younger Men? A Cohort-Based Analysis," by David Card and Thomas Lemieux, *The Quarterly Journal of Economics*, vol. 116, no. 2, 2001, pp. 705–46.

<sup>4</sup> Because census data are available only until 2000, most of the analysis in this article is limited to the period from 1980 to 2000.

<sup>5</sup> Studies relying on supply-and-demand analysis include "Changes in Relative Wages, 1963–1987: Supply and Demand Factors," by Lawrence F. Katz and Kevin M. Murphy, *The Quarterly Journal of Economics*, vol. 107, no. 1, 1992, pp. 35–78; "Computing Inequality: Have Computers Changed the Labor Market?" by David H. Autor, Lawrence F. Katz and Alan B. Krueger, *The Quarterly Journal of Economics*, vol. 113, no. 4, 1998, pp. 1169–213; "Higher-Education Policies and the College Wage Premium: Cross-State Evidence from the 1990s," by Nicole M. Fortin, *American Economic Review*, vol. 96, no. 4, 2006, pp. 959–87; and "Long-Run Changes in the U.S. Wage Structure: Narrowing, Widening, Polarizing," by Claudia Goldin and Lawrence F. Katz, NBER Working Paper no. 13568, National Bureau of Economic Research Inc., 2007.

<sup>6</sup> This methodology is similar to note no. 5, Katz and Murphy.

<sup>7</sup> See note no. 5, Katz and Murphy, for the nation.

<sup>8</sup> Following note no. 5, Katz and Murphy, the demand index is measured as a weighted average of percent change in sectoral employment shares, in which the weights are the share of the sector in that group's overall employment.

<sup>9</sup> See note no. 5, Goldin and Katz.

<sup>10</sup> See note no. 5, Fortin.